DESCRIPTION OF THE ADULT OF *LEPTOCEPHALUS ECHELOIDES* D'ANCONA (1928), A DEEPWATER SNAKE EEL, GENUS *OPHICHTHUS* (OPHICHTHIDAE), FROM THE GULF OF AQABA

by

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ABSTRACT. - *Leptocephalus echeloides* D'Ancona (1928a), a deepwater snake eel, is referred to *Ophichthus*, subfamily Ophichthinae, and described from an adult specimen captured by trammel net at 300 m from Eilat, Red Sea. It is compared to related ophichthids from the western Indian Ocean and Red Sea and differs from all known ophichthines in the condition of its dentition, dorsal fin origin, numerous head pores, coloration, and low vertebral number.

RÉSUMÉ. - Le stade adulte de *Leptocephalus echeloides* D'Ancona (1928a) a été trouvé dans les eaux profondes (300 m) d'Eilat, au nord du golfe d'Aqaba, mer Rouge. Il est rapporté au genre *Ophichthus* de la famille des Ophichthidae. Il se distingue par les dents, l'origine de la nageoire dorsale, les pores céphaliques, la couleur et le nombre peu élevé de vertèbres.

Key-words. - Ophichthidae, *Ophichthus echeloides*, *Leptocephalus*, ISW, Red Sea, Adult description, Taxonomy.

Recent experimental deep water fish collecting (150-550 m) in the Gulf of Aqaba has resulted in the capture of a number of species new to the Red Sea, several of which are poorly known or new to science (Baranes and Golani, 1991; Golani and Baranes, 1991). Among the anguilliform fishes were an undescribed congrid (to be described by A. Ben-Tuvia), *Gymnothorax johnsoni* (Smith, 1962), a moray previously known only from South Africa (Castle and McCosker, 1986), and an adult ophichthid, genus *Ophichthus*, which differs remarkably from any known species.

After initial study and comparison with other Indo-Pacific *Ophichthus*, we were prepared to describe the specimen as a new species. We were apprehensive to do so, however, in that a Red Sea ophichthid *leptocephalus* was described by D'Ancona (1928a) that was said to possess a myomere count nearly identical to the vertebral count of our specimen (124 vs 125). No subsequent specimens of *Leptocephalus echeloides* D'Ancona have been reported and our attempt to locate the holotype and only know specimen was unsuccessful. Rather than add another taxon to the literature, we therefore refer our specimen to *Ophichthus echeloides* (D'Ancona) and provide the first description of the adult of this remarkable deepwater snake eel.

Snake eels and worm eels of the family Ophichthidae are the most diverse and speciose of apodal fishes, with more than 55 recognized genera and more than 250 species (McCosker *et al.*, 1989). They occupy a variety of habitats, from freshwater streams and intertidal pools to continental margins at depths of 720 m or more.

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Ophichthids are poorly known, largely due to the secretive and burrowing behavior of most species.

The most recent treatment of Red Sea ophichthids was that of Smith (1962), which is in need of revision. Dor (1984) listed records of Red Sea ophichthids, which included six genera and nine species of ophichthines, two genera and five species of myrophines, and two leptocephali that are probably ophichthids. Nemtzov *et al.* (1987) reported the ophichthine *Brachysomophis cirrhochilus* from the Gulf of Aqaba, which brings the Red Sea ophichthid species total to at least 16. Extralimital studies bear on our work. Karrer (1982) included three deep water ophichthids in her Mozambique Channel review, and McCosker (1986) described a new *Ophichthus* from a single deepwater specimen trawled off western South Africa. McCosker and Castle (1986) treated 29 southern African species, however a considerable knowledge gap exists between the Red Sea assemblage and that of South Africa. The deepwater benthic species of the Indian Ocean are probably the most poorly known of ophichthids, and it is most likely that additional new species will be discovered.

Taxonomy

The genus *Ophichthus* (*sensu lato*) is the most speciose of ophichthids, with approximately 50 tropical and subtropical species worldwide. The species may be diagnosed as follows: moderately to very elongate ophichthid eels of the subfamily Ophichthinae, tribe Ophichthini, with head and trunk shorter than tail; dorsal fin origin above or behind gill openings; pectoral fins present and developed; snout and jaws moderately elongate; lips without numerous barbels or fringe; anterior nostrils opening via a tube; posterior nostrils opening into mouth or along lower edge of lip; eye moderately developed; gill openings lateral, elongate and crescentic; teeth conical and numerous, but never caniniform; tail tip a finless point; and coloration variable, often marked, but generally uniform and darker dorsally. Several subgenera are recognizable within *Ophichthus*, however a worldwide revision has yet to be attempted (McCosker, 1977).

MATERIAL AND METHODS

Measurements are straight-line, made either with a 300 mm ruler with 0.5 mm gradations (for total length, trunk length, and tail length) and recorded to the nearest 0.5 mm, or with dial calipers (all other measurements) and recorded to the nearest 0.1 mm. Body length comprises head and trunk lengths. Head length is measured from the snout tip to the posterodorsal margin of the gill opening; trunk length is taken from the end of the head to mid-anus; maximum body depth does not include the median fins. Vertebral counts (which include the hypural) are taken from radiographs. The adult specimen described herein is deposited in the Fish Collection of the Hebrew University of Jerusalem.

OPHICHTHUS ECHELOIDES (D'ANCONA, 1928a)

(Figs. 1-2)

Material examined

HUJ 14133, 518 mm total length, apparently a male. Captured by trammel net at 300 m, Eilat, Red Sea, on 14 Dec. 1989.

Diagnosis

A moderately elongate, cylindrical species of *Ophichthus* with the following unique combination of characters: tail 58% of total length (TL); dorsal fin origin above

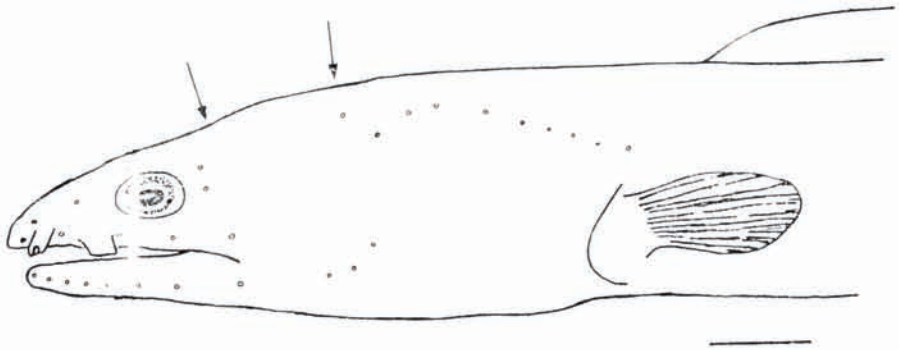

Fig. 1. - Diagrammatic representation of head and anterior trunk region of *Ophichthus echeloides*, HUJ 14133. Arrows indicate location of interorbital and temporal pores. Scale bar indicates 10 mm.

middle of pectoral fin; pectoral fin rounded; 9 mandibular and 3 preopercular pores; teeth small, conical, biserial in jaws, uniserial on vomer; vertebral formula 11-50-124.5; and coloration tan, darker dorsally, fins and lower half of trunk and body pale.

Counts and measurements (in mm)

Total length (TL) 518; head length 62; trunk length 153; tail length 303; body depth at gill openings 22; body width at gill openings 18; body depth at anus 19; body width at anus 18; tip of snout to dorsal fin origin 72; left pectoral fin length 7.8; base of left pectoral fin 6.1; gill opening length 11.2; isthmus 14.1; snout 11.3; snout tip to rictus of jaw 21.5; eye diameter 6.3; interorbital distance 9.5. Total vertebrae 125; predorsal vertebrae 11; preanal vertebrae 50.

Description

Body moderately elongate, cylindrical anteriorly, laterally compressed in tail region, tapering to a blunt finless point. Body depth behind gill openings 23.5 in TL. Head and trunk 2.4 and head 8.4 in TL. Snout blunt, smooth, not split between anterior nostrils. Jaws subequal. Anterior nostrils within a short, slightly anterior-facing tube. Posterior nostril in edge of upper lip and covered by a flap. A small but apparent papilla before leading edge of posterior nostril. Eye large, its anterior margin in line with middle of upper jaw. Interorbital space flat and broad.

Median fins within a slight groove, but obvious if elevated. Pectoral fin rounded. Caudal tip blunt, the median fins disappear within a groove about an eye diameter before tail tip.

Head pores not obvious, difficult to discern (Fig. 1). Nine mandibular, 3 preopercular, 4 supraorbital, 5 infraorbital (1 before anterior nostril, the 2nd between nostrils), and single interorbital and supratemporal pores. Lateral-line pores minute, not possible to discern.

Teeth small, conical, and close-set (Fig. 2). An intermaxillary rosette of 3 teeth is followed by 2 pairs of teeth, followed by 10 uniserial vomerine teeth, the first the largest, the others subequal. Upper jaw teeth biserial, the outer row 33-34 smaller teeth which extend beyond the level of the eye; the inner row shorter in length, ending at rear margin of eye, the 12 teeth larger in size. Lower jaw teeth biserial, nearly subequal but grading slightly smaller posteriorly. Thirty-seven teeth on outer row, 29-32 on inner row.

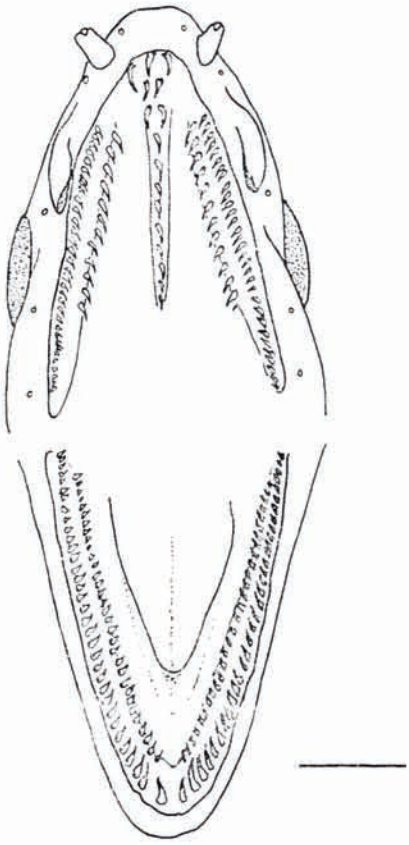

Fig. 2. - Diagrammatic representation of dentition of *Ophichthus echeloides*, HUJ 14133. Scale bar indicates 5 mm.

Body coloration in life brown dorsally, cream below lateral line. Pectoral fins colored like lower body. Coloration in isopropyl alcohol tan dorsally, yellow below lateral line, throat, chin and chest white. Fins pale.

Remarks

Leptocephalus echeloides was described by D'Ancona (1928a: 69, pl. 4, figs 5-5b) on the basis of a specimen captured in December 1923 at a depth of 276 m near Perim (= Barim) Island, located near the intersection of the Gulf of Aden and the Red Sea. He provided the following measurements (in mm) and counts: total length 75; body depth 7; head length 5; head and trunk length 42; predorsal distance 35; preanal myomeres 66; postanal myomeres 58. It was subsequently listed by D'Ancona (1928b: 430; 1928c: 519), listed and illustrated (but based upon the original illustrations) by Fowler (1956: 112, fig. 59), and listed by Castle (1969: 38) and by Dor (1984: 37). (Dor identified the holotype as MSNV P-10, presumably Museo Civico di Storia Naturale, Venice, Italy, however we were unable to confirm the existence of the specimen). Its adult stage, until now, has not been surmised. The characteristics upon which we correlate D'Ancona's *leptocephalus* with our adult include: the location of the origin of the dorsal fin; the condition of the nephros of the second to last gut loop; and the myomere/vertebrae (124/125) relationship.

Adult *Ophichthus echeloides* are similar in general appearance to some other deepwater species of *Ophichthus*, but differ from them all in the condition of its fin location and shape, head pores (particularly the nine mandibular pore pairs), and low vertebral number. Using the species identification key in Smith (1962) and McCosker and Castle (1986), it would be referred to the couplets comprising *O. unicolor* and *O. apicalis*. It is easily differentiated from both of them in its lower vertebral count, its pectoral/dorsal fin relationship, in its snout shape, and in its dentition. It differs trenchantly from *O. retifer* (= *O. erabo*, cf. McCosker and Randall, 1982), the only other known Red Sea congener (Dor, 1970), on the basis of its coloration, counts and proportions. From *O. brachynotopterus*, a deepwater (355-478 m) species described by Karrer (1982) from northwest Madagascar, it differs in having a more anterior dorsal fin origin and many fewer vertebrae (125 vs 178). From nearly all other known species of *Ophichthus*, *O. echeloides* differs in its low vertebral count.

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